Frontline X240™ Protocol Analyzer Quick Start Guide

1 Introduction

Use this document for quick installation and setup.

Frontline® X240™ is capable of capturing and demodulating all RF channels and packet types defined in all released Bluetooth specifications and beyond. The user is not required to specify the addresses of the devices to be captured or their roles (central or peripheral) during the connection lifetime. Prior to capturing the data, the user does not need to enter any information (PIN, OOB, long term key, link key) used to encrypt or decrypt data. X240™ provides live capture of all 79 Classic Bluetooth channels or 40 Bluetooth low energy channels storing data for both live and post-capture analysis. This quick start guide provides sufficient information to begin data capture. Detailed hardware and software information is contained in the *Wireless Protocol Suite Hardware and Software User Manual*. The manual is available on www.teledynelecroy.com/protocolanalyzer/solutions-wireless.aspx.

Frontline X240 Protocol Analyzer

2 Components

Inspect the received shipping container for any damage. Unpack the container and account for each of the system components listed on the accompanying packing list. Visually inspect each component for absence of damage. In the event of damage, notify Teledyne LeCroy.

Retain all shipping materials for shipper's inspection. The X240 hardware does not contain any user serviceable items. Any repairs and maintenance must be performed by a service technician that has been trained and approved by Teledyne LeCroy. Before any service is performed on X240, all power sources must be removed. This includes disconnecting any USB cables. The user should use the AC power supply and car adapter included with the X240. USB Type C power must be provided via PD.

The analyzer package includes the following components in addition to the X240:

	Description		Description
1	5V @ 3A Type C PD Power Supply	1	6' Ethernet Cable, CAT 6 (1 Gbps), BLACK
2	3' USB 3.0 Type C to C cable	3	RF 2.45GHZ/5.3GHZ WHIP TILT Antenna
1	3' USB 3.0 Type C to A cable	2	USB Car Charger PD

3 Computer System Requirements

Supported Systems

- Operating System: Windows 10 and 11
- USB: USB 2.0 and later

Minimum Requirements

- Processor: Core i5 at 2.7 GHz
- RAM: 4 GB
- Free Hard Disk Space on C: drive: 20 GB

Install Software

Download the latest Wireless Protocol Suite installer from TeledyneLecroy.com.

https://go.teledynelecroy.com/x240-software.

Once downloaded, double-click the installer, and follow the directions.

When the installation is complete pin the Wireless Protocol Suite icon to your taskbar.

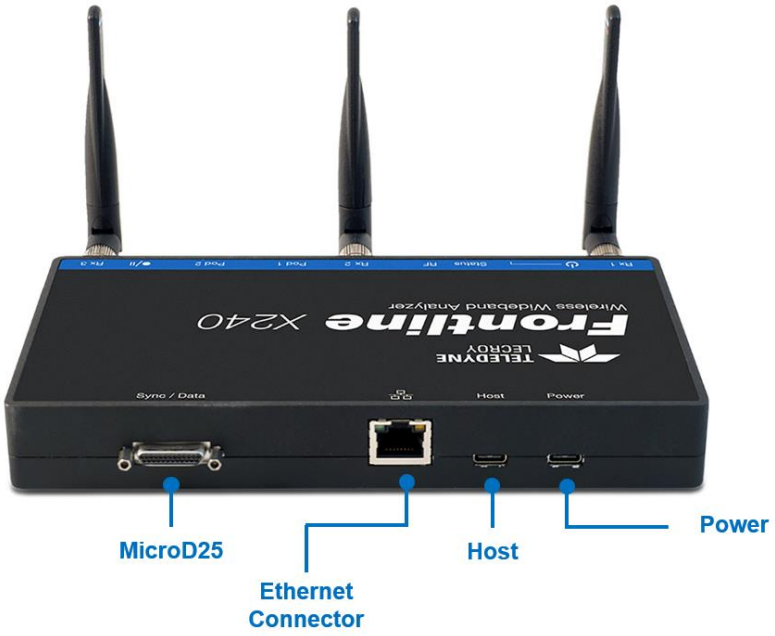
4 Set Up Hardware

1. Connect Cables

Power Connector: Connect the Type C PD power adapter supplied with the X240 to the “Power” connector on the back of the unit.

Connect to Host PC: Connect the USB C 2.0/3.0 cable between X240 Host port and the host computer where the Wireless Protocol Suite resides. This connection allows sending command, control, and data transfer to the host PC. The data transfer is also possible over Ethernet. Please refer to the user manual for details.

If the USB cable is connected to a computer with a USB C 3.0 with power delivery or higher, then the X240 can be powered through this connection and will **not** need a USB cable connected to the Power connector on the X240.

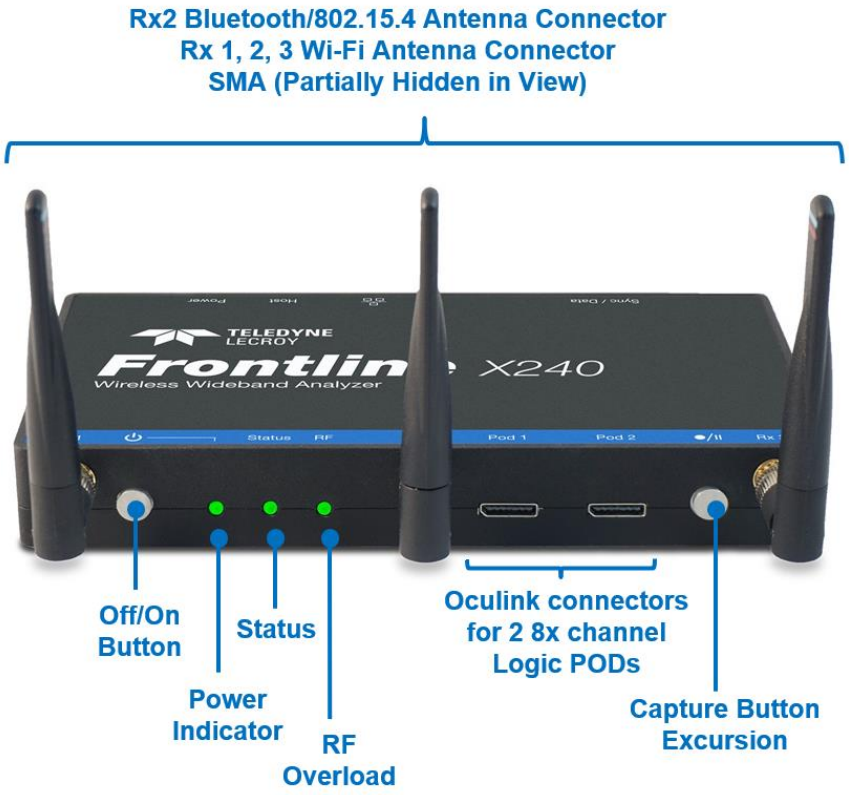


Frontline X240 Rear Panel Controls

2. Attach Antennas

Attach the three antennas to the SMA connectors on the front panel on X240. Rx2 is Bluetooth and 802.15.4 data capture and Rx1, 2, 3 are Wi-Fi antenna to capture Wi-Fi 5. The base of the antennas can be carefully rotated by 90 degrees so that the antenna points upward.

NOTE: The nuts for RF Antenna SMA connections should not be tightened beyond 1 in-lb of torque.



Frontline X240 Front Panel Controls

Excursion Mode: Pressing “Capture button” on the hardware will begin data capture on the box without a PC. To operate in the Excursion mode, the X240 hardware must have been previously configured from the **Wireless Protocol Suite** prior to disconnecting from the computer. The X240 hardware will retain those configuration settings when disconnected from the computer. The **Excursion Mode** button is inactive when X240 is connected to a computer.

Refer to the Wireless Protocol Suite Hardware and Software User Manual for Excursion mode operating details.

3. Power-up Hardware

Power Button: To apply power to X240 hardware depress and release the Power button on the front panel. This action will provide a clean start for X240 hardware. The front panel **Power** indicator LED will be a constant green.

Should the front panel **Power** indicator begin blinking red, the X240 hardware is approaching thermal overload temperature between 70° C and 80° C (158° F and 185° F) and should be shutdown. When the hardware reaches thermal overload, it will automatically shut down and the **Power** indicator will turn off.

Status Indicators: Colored LEDs show the status of power, capture, and RF Status.

Table 1: X240 Front Panel Status Indicators

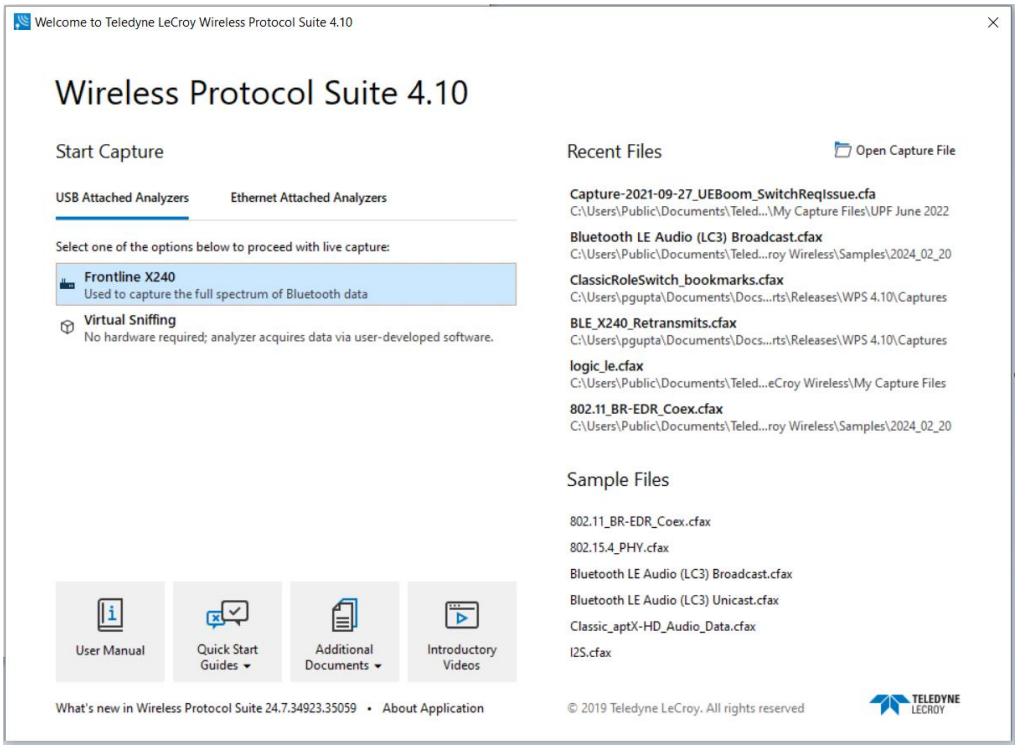
Indicator	Color	State	Status Indicated
Power	Blue	Constant	Unit is connected to power source but powered off.
	Purple	Constant	Insufficient Power
	Green	Constant	Unit is switched on and has sufficient power.
	Red	Fast Flash	Unit is approaching its maximum thermal load and should be shut down.
		Constant	Unit has reached thermal overload or Unit has started a controlled/sequenced shutdown.
Status	None	Off	Unit is powered off.
	Yellow	Slow Flash	Initializing (may not be seen if initialization is quick).
		Fast Flash	Unit is shutting down.
		Constant	Unit is in Recovery Mode.
	Green	Constant	Unit is initialized and ready to capture.
	Blue	Slow Flash	Unit is waiting for a Trigger (future).
		Fast Flash	Unit is capturing in Excursion mode or capture is not "OK" (future).
		Constant	Unit is capturing data.
	Red	Constant	The unit failed to initialize or has a System Error.
RF	None	Off	Unit is powered off or Unit is not actively capturing data.
	Green	Constant	Unit is capturing Bluetooth data.
	Red	Fast Flash	The RF signal is too strong.

Recovery Mode: Recovery mode occurs when something prevents the x240 unit from successfully loading the firmware images during power up. In this state, the x240 powers on with an alternate recovery firmware image. When the unit is in recovery mode, the status indicator light is a solid yellow.

In recovery mode, the system prevents the user from capturing data. However, the user can upgrade the firmware. The upgrade process should correct the problem allowing the unit to power on normally. When the Wireless Protocol Suite software starts, the software automatically prompts the user to update the firmware.

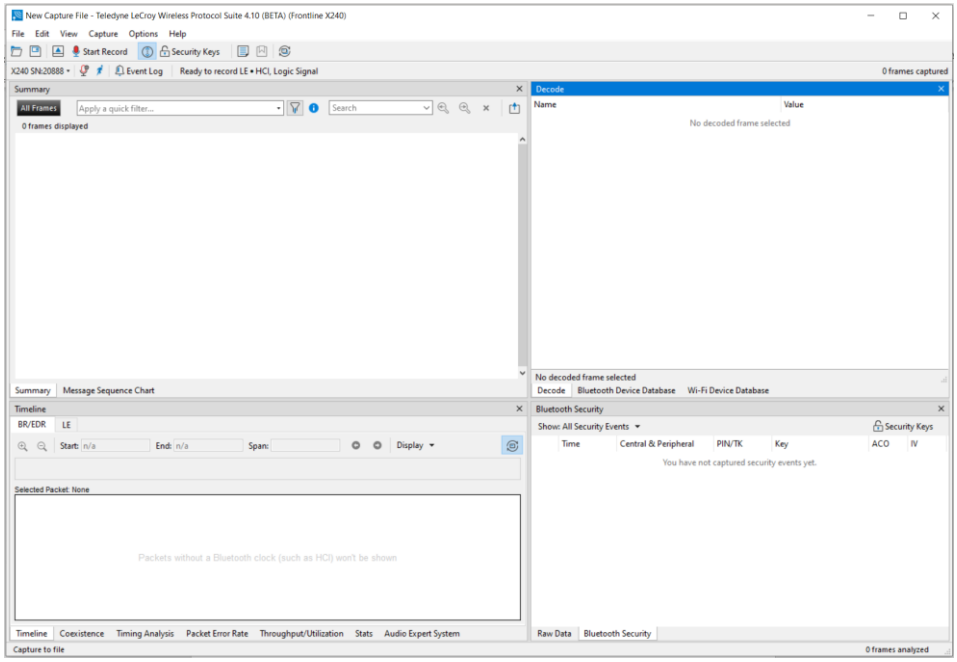
5 Configuration

Start the Wireless Protocol Suite software. The Start Page window displays the X240 option. Select X240.



Wireless Protocol Suite - Start Page

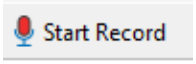
When the Wireless Protocol Suite window pops up, you will see the following display with the Analyzer Toolbar that controls hardware record and configuration options. Your unit is preconfigured with licensed features.



Wireless Protocol Suite software with Analyzer Toolbar

6 Begin Capture

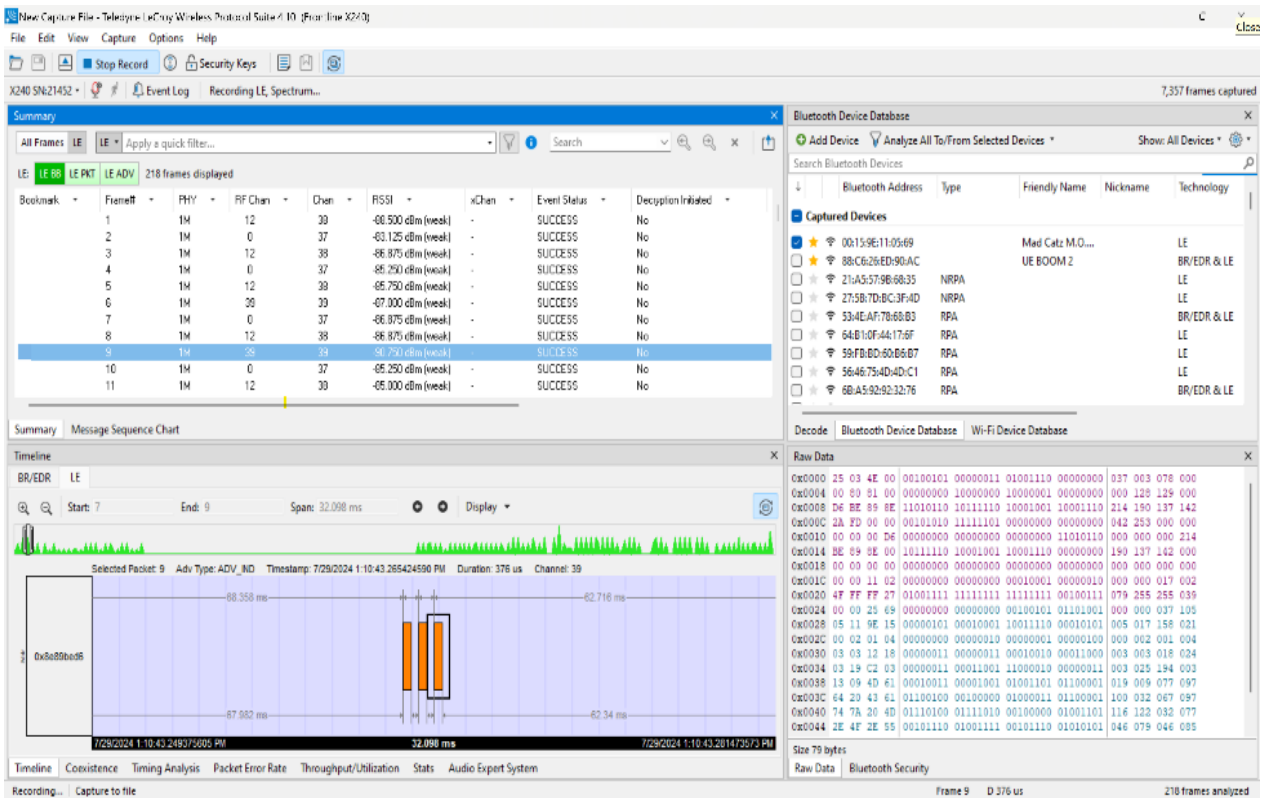
Start Record



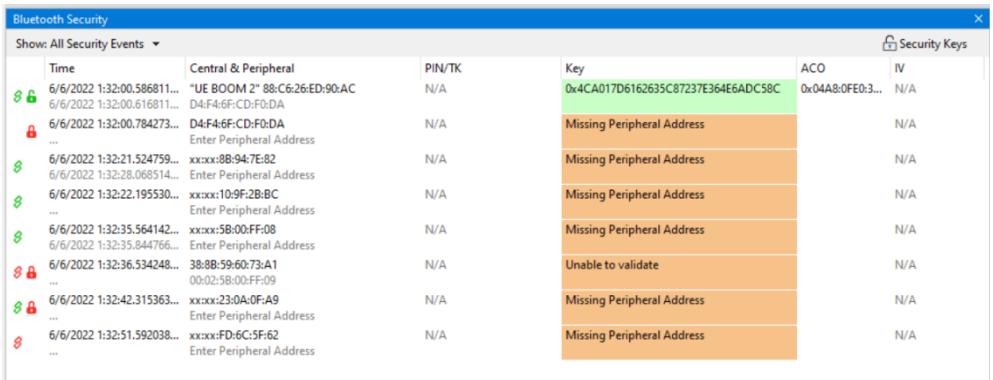
On the Wireless Protocol Suite's Toolbar, click the Start Record button or select Start Record from the Capture menu option. When the Start Record button changes to Stop Record, the X240 hardware is capturing data from all active Bluetooth devices within range and displaying data in the software based on the device selection. The Analyzer Bar shows a running total of captured packets by the hardware. The data appears in the Summary Pane, Message Sequence Chart, Coexistence View, Bluetooth Timeline, Low Energy Bluetooth Timeline, PER Stats, etc.

If you don't see any data in the software, check your device selection and filter settings in the Bluetooth or Wi-Fi device database window.

The Device Database pane populates with any newly discovered devices. The device selection for analysis can be done while recording. Selecting specific devices of interest filters new data automatically. The Bluetooth Security pane under View Menu shows all encrypted Bluetooth links. The securities keys can be entered while recording data. Adding security key will update display automatically. The Status Bar shows a running total of captured packets.



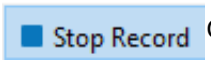
Wireless Protocol Suite software



Bluetooth Security Pane

7 Saving Analyzed Data to Disk

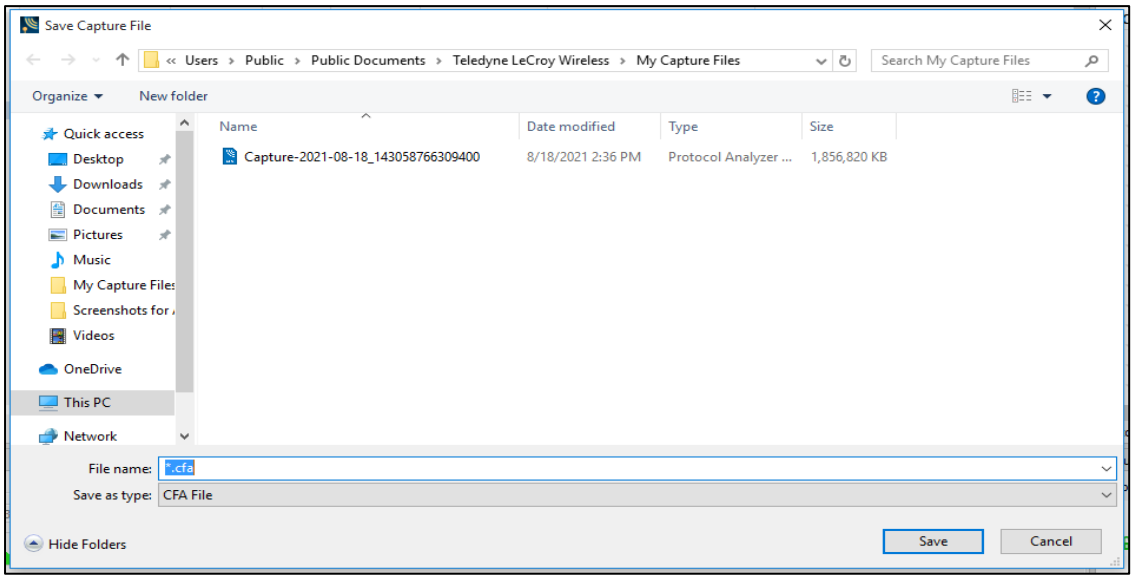
Stop Record



Click the Stop Record button to stop recording.

Save File

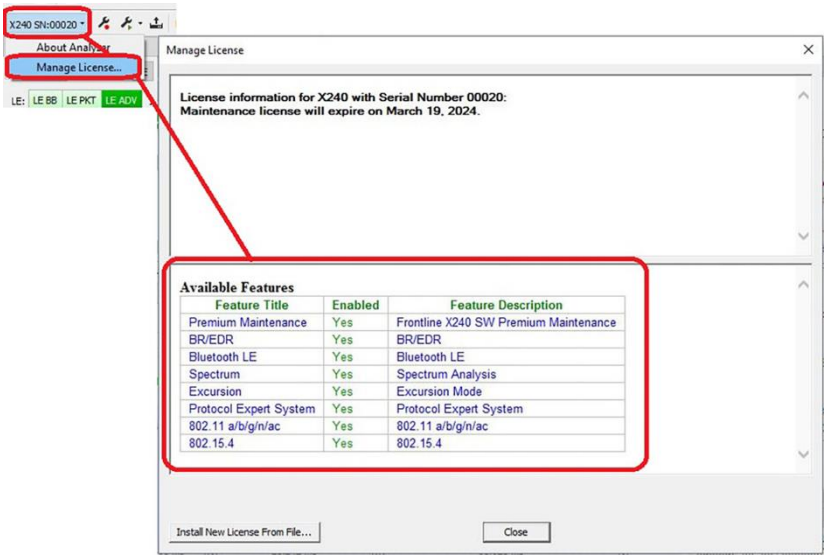
Click the Save As icon to save the file to the selected location.



Saving Analyzed Data

8 License Manager

The user can find out the status of the X240's license by selecting **Manage License from the X240 Analyzer Toolbar.**



9 Environmental Conditions

Other Specifications

- Dimensions: 7.5" wide x 4" deep x 1" tall (190.5 x 101.6 x 25.4 mm)
- Weight: 1.5 lbs.
- Input Voltage: 5 V
- Input Current: 3 A
- Max Power: 15 W
- Temperature: Operating 32° F to 122° F (0° C to 40° C)
- Humidity: Operating 0% to 80% RH (non-condensing)

Teledyne LeCroy Customer Support

Online Download

Periodically check the Teledyne LeCroy Protocol Solutions Group web site for software updates and other support related to this product.

Web: www.teledynelecroy.com/protocolanalyzer/solutions-wireless.aspx
Sales: Frontline_OnlineSales@Teledyne.com Support: Frontline_Techsupport@Teledyne.com

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